



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
---------------	-------------	----------------------	---------------------

08/551,595 11/01/95 GAGGER

S 8CP-12236

EXAMINER

HOKE, V

ART UNIT

PAPER NUMBER

15M1/0226

LI-HUA LUO
GENERAL ELECTRIC COMPANY
ONE PLASTICS AVENUE
PITTSFIELD MA 01201

1511

DATE MAILED:

02/26/96

This is a communication from the examiner in charge of your application
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final

A shortened statutory period for response to this action is set to expire 3 month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892 | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 1 to 8 are pending in the application.

Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☒ Claims 1 to 8 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation)

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved, ☐ disapproved (see explanation)

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received
☐ been filed in parent application, serial no. _____, filed on _____

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213

14. ☐ Other

EXAMINER'S ACTION

Art Unit: 1511

15

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

16.

Claims 1 to 8 are rejected under 35 U.S.C. § 103 as being unpatentable over Gosens et al., Wittman et al., Kambour, Fukasawa et al. and Kress et al. (260).

The instant claims patentability is asserted as being based on determinations of unexpected mechanical properties manifested along with the expected flame proofing results exhibited in PC/Styrenic resin blends when utilizing the polyphosphates of Gosens wherein in 1 to 5 are the higher molecular weight analogues which are within Fukasawa's teachings, column 2, formula (D), in 1-30) by requiring that the styrenic graft resin content be such that its rubber content is equivalent to 6-12 percent by weight of the total composition, and the composition's polyphosphate content be 3 to 15% by weight of the total composition.

Art Unit: 1511

strength resistance after humidity exposure -- specification at page 2 "Summary of the Invention". The presence of polytetrafluoroethylene a known drip inhibitor during pyrolysis is also present. The latter resin also known as Teflon is optional according to Gosens as well -- column 5, line 15, column 6, line 28 and the examples.

The examiner will concede arguendo, that while Gosens et al. teaches styrenic copolymers presence which are devoid of rubber, there is a clear preference for the latter's inclusion either as the sole styrenic resin e.g. ABS-1, 2 or 3 in column 6 or in admixture with a styrenic resin devoid of rubber e.g. SAN in column 6, as all of his working examples typify. Furthermore the rubber content of the exemplified solely ABS-constituted resin compositions (see Table C -- examples V and X and Table B example V) are those in which the rubber content is 30, 70 or 50% by weight of the graft resin as defined in column 6, *ibid*. Accordingly there appears to be a preference for styrenic grafted - rubber copolymers, when used as the sole styrenic resin, those which contain at least 30% by weight rubber in the graft - copolymer.

Applicant utilizes per 60 to 90% PC resin in the blend, 8 to 15% by weight of the grafted styrenic rubber and 1 to 10% by weight of the rigid SAN resin. In Table C Gosens utilizes 9-12% of the ABS resin per 3-15% of SAN. Fifty to seventy percent diene content in ABS resin is equivalent to 4.5 to 8.4% diene rubber in total composition. This range is well within applicants stipulated 6 to 12 percent of total composition.

Art Unit: 1511

The Kress et al. (column 8, lines 30-37) and Wittman et al. (column 10, lines 19-23) disclosures wherein monophosphates are used in otherwise constitutionally comparable compositions also relate by way of examples that the rubber content comprises 50% by weight of the styrenic graft copolymer. Even Kambour whose dialkylated phenyl esters of phosphoric, similarly resorcinol bridged as may characterize Gosens aryene bridged compounds (X = resorcinol, column 4, lines 61-23) cites the inclusion of a styrene-butadiene resin's wherein the diene content is preferably 60 to 70% by weight butadiene (column 2, lines 1-55 and column 5, lines 38-43).

Wittman et al. and Kress et al. reveal by example that while this preference for 50% by weight or greater diene content in the styrene graft exists, the use of styrenic copolymers having smaller quantities of rubber are also useful. Thus in column 1 of Wittman et al. of a styrenic/nitrile (or acrylate) copolymer grafted onto rubber (defined in columns 6 and 7) the rubber component may constitute 10-95 parts by weight of the graft copolymer and Kress et al. relates the same stipulation (column 1, lines 49-61 and column 6, line 4 et seq.).

The use of styrenic graft copolymers of high rubber content appears to be based on the need to offset the plasticizing effect of phosphate flame retardants in order "to recover the impact resistance of the original polycarbonate", to wit see Kambour (column 5, lines 25-42).

Applicant's composition comprises a mixture of the graft styrene resin and styrene copolymer devoid of rubber.

Art Unit: 1511

Applicants examples on page 17 purport to establish the criticality of the 6% minimum diene content.

It is known that styrenic resins are more flammable than aromatic polycarbonates. It is also known that flame retardants become localized in varying degrees in the rubber portions of styrene grafted rubber copolymers. The degree of localization is inversely parallel to the rubber's ability to impart flexibility. Accordingly less rubber in the styrenic graft copolymer permits the flame retardants greater distribution in the styrenic phase and hence allows the rubber phase to confer the flexibility for which role its presence is sought in the first place. Applicants use of a narrow low range (8-15%) concentration of the grafted styrenic resin having a high rubber content (40 to 90 wt. % of the graft - specification at page 5, last paragraph) permits the achievement of a low diene rubber content based on the total weight of the composition in conformance with Gosens' examples. Determining the optimum quantity of phosphate within the broad range already espoused by Gosens, when utilizing a grafted styrenic rubber which presence itself is sought for impact strength resistance, is within the routineer's skill inasmuch as it is known that the phosphates' presence per se ordinarily causes some debilitation in this regard.

To the extent the polyphosphates employed have repeating units exceeding the n = 1.5 rating of Gosens, e.g. 6 to 30 (specification at page 11), Fusakawa et al. relates that they are known flame retardants interchangeable with the lower molecular weight oligomers of Gosens.

Art Unit: 1511

(column 2, lines 16-35) which are applicable in polymer matrices wherein ABS resins and/or polycarbonates may comprise one or more of the substrates. As such, its alternative application here is rendered obvious.

The combination of low and moderately low molecular weight PC with SAN copolymers having a average molecular ranges of 2,000 to 10,000 and 10,000 to 100,000, respectively as components (a) and (c) of this composition is not unique. Gosens relates SAN of a molecular weight value of 100,000 (column 6). Moreover the correlation of a number average molecular weight in the claims and specification at pages 5 and 9 are not established by the comparative examples which relate only to weight average molecular weight (specification at pages 16 and 18). Since number average molecular weight is the mean molecular weight of chains making up the polymers while weight average molecular weight is the sums of the squares of each molecular weight divided by the sum of the molecular weights, there need not exist any requisite correlation. Hence this optional parameter has not been considered significant in applying the prior art inasmuch as the examples fail to indicate that such limitations were adhered to in making the instant formulations.

V. P. Hoke:cb
Primary Examiner

Wednesday, February 21, 1996
Thursday, February 22, 1996
Friday, February 23, 1996

VERONICA P. HOKE
PRIMARY EXAMINER
GROUP 1500